

REMARKS

Applicants have amended the claims in order to more particularly define the invention taking into consideration the outstanding Official Action. In this regard, the objection to claims 5 and 6 has been carefully considered but is believed to be obviated by the amendments to the claims as fully supported by the specification as originally filed as would be interpreted by one of ordinary skill in the art. The expression "ready to cook" has been replaced by part-cooked and the language noted on page 2 of the Official Action that the process relates to the preparation of a product which is a french fried potato. Support for this language is found on page 3, lines 10 and 20. The term "which" has been replaced with wherein. The lactic acid producing microorganism has been limited to a lactic acid producing "bacterium" for which support can be found at page 1, line 26. Also in claims 5 and 6 the language "to reduce acrylamide production in subsequent cooking thereof, wherein said...." has been inserted based on applicants' specification at page 1, lines 23-24.

The amendments in respect of claims 5 and 6 are considered to address the objections under item 1 of the Action. As described in the applicants' specification, the invention is especially applicable for the production of oven-ready french fried potatoes and ready-to-fry potatoes. These are provided to the consumer in "part-cooked" form either for oven baking or for deep frying prior to serving (see page 3, lines 18-23). The "ready to cook" potatoes which are prepared in claims 5 and 6 are already partially cooked, hence the reference in these claims to "frying" the treated potatoes. Accordingly, it is most respectfully requested that the objection to claims 5 and 6 be withdrawn.

New claims 10-12 have been added to the application. Claim 10 relates to a preferred aspect of the invention which was deleted from claim 7. Claims 11 and 12 relate to a reduced amount of acrylamide as support by the specification, see for example, Table 1 on page 7. Applicants most respectfully submit that all of the claims

now present in the application are in full compliance with 35 USC 112 and are clearly patentable over the references of record.

The rejection of claims 5, 7 and 8 under 35 U.S.C. §102(b) as being anticipated by Hilton et al. USP 4,140,801 as evidenced by Porro et al has been carefully considered but is respectfully traversed in view of the amendments to the claims. Claims 5 and 7-8 (which cover the use of lactic acid producing microorganisms) based on US '801 as evidenced by US '006. US '801 is concerned with lowering the reducing sugar content of potatoes and employs yeast for this purpose. The Examiner acknowledges that this document alone fails to specifically teach the requisite lactic acid producing microorganisms and so relies on US '006 to suggest that the yeast would *inevitably* produce lactic acid during the fermentation process. However, the yeast strains disclosed in US '006 are specially modified for the production of lactic acid with a gene coding for lactic dehydrogenase. There is nothing to suggest that the yeast disclosed in the first reference (US '801) is modified in such a way.

In relation to US '801, it should be noted that the primary product of fermentation of glucose using yeast is ethanol. Very little lactic acid is produced. In this earlier document it is also taught that a minor amount of yeast should be used and for a quite different purpose to that described in the present application, namely to improve resistance of the potato product to browning during frying (see col. 3, lines 39-45). The reason for using low amounts of yeast is so that the taste and quality of the end product is not adversely affected (note that if the amount of yeast was increased, other chemical reactions such as the production of ethanol would be dominant).

Nevertheless, in order to clearly distinguish the claimed invention over US '801, the claims have been limited the microorganisms to lactic acid producing bacteria. This amendment excludes fungi such as yeast. Accordingly, it is most respectfully requested that this rejection be withdrawn.

The rejection of claims 6 and 9 under 35 U.S.C. §102 as being anticipated by Gertz et al has been carefully considered but is most respectfully traversed in view of the amendments to the claims. This rejection is based on a paper by Gertz *et al.* which

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is not prior to the priority date of the present invention. That is, Applicants have established that this paper was not received by the journal until 27 September 2002 and was not published online until 12 November 2002 (see attached web page). Since both of these dates fall after the priority date for the present application (24 September 2002), this obviates the outstanding rejection. See the claim for priority and the priority document acknowledged in the outstanding official Action . Claim 6 appears in the priority application and claim 9 also is included in the disclosure of this document which encompasses such products and should suffice to establish a date of invention for the subject matter of this claim. Accordingly, it is most respectfully requested that this rejection be withdrawn.


The rejection of claims 5 and 7-8 under 35 U.S.C. §103 as being unpatentable over Kaaber et al has been carefully considered but is most respectfully traversed in view of the amendments to the claims and the following comments. The Official Action relies on an earlier paper by Kaaber *et al.* This paper is concerned with the problem of reducing unacceptable browning of sliced potato chips on frying. Fermentation of the sliced potato chips with lactic acid bacteria prior to frying is carried out with the specific intention of lowering the content of reducing sugars (since it is known that the high content of such sugars is the limiting factor in the production of fried potato products having an acceptable light colour). In contrast to this earlier article, the applicant's invention is concerned with reducing the production of the toxic contaminant acrylamide on cooking French fries. None of the prior art which is relied on in the rejection (and which was published before the claimed priority date) contains any hint that there may be any link between these two effects, i.e. lowering the reducing sugar content and the reduction in acrylamide formation. Those skilled in the art would thus have no reason to believe that the lactic acid producing bacteria taught by Kaaber *et al.* would have this novel effect. Accordingly, the use of lactic acid producing microorganisms to reduce acrylamide formation is not considered obvious in light of the prior art.

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In view of the above amendments, an early action on the application is now in order and is most respectfully requested.

Respectfully submitted,

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Special Topic

Analysis of acrylamide and mechanisms of its formation in deep-fried products

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Abstract

A reliable and sensitive gas chromatography-mass spectrometry method was developed for the determination of acrylamide, a toxic compound recently discovered in baked, fried or grilled food. Satisfactory results for repeatability and recoveries were obtained by this method. The limit of detection for acrylamide was 15 µg/kg food and recoveries were between 95 to 103%.

The improved method was then employed to study the influence of heat, heating time and type of frying oil on the formation of acrylamide during the deep frying of French fries. In this matrix acrylamide formation was promoted by heating in a time-dependent manner. It appeared that acrylamide arose, when reducing sugars, dimethylpolysiloxane or partial glycerides were present. Three mechanisms of formation are discussed in this context. Although the mechanistic complexity increases dramatically in the presence of various food components, some recommendations can be given to minimize acrylamide levels in deep fried products.

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